Mr .Odoping ceaser- 0778216230/0702803195 .

Candidate's name…….

Signature…….stream

545/1

CHEMISTRY

paper1

2025

DEPARTMENT OF CHEMISTRY

S.4 PRE-REGISTRATION EXAMS

Uganda certificate of education

CHEMISTRY

2hours

INSTRUCTIONS TO CANDIATE:

This paper consists of six examination items which divided into two sections; A and B

Section A has two compulsory items. Answers to section A must be written in spaces provided

Section B has two parts i and ii. answer one items from each part

Answers to section B should be written booklet provided

Answer four items in all

Any additional items will not be scored.

SECTION A

Answer all items from this section in spaces provided.

Item 1.

Most of the food vendors in Hoima city central market are complaining about the losses they are incurring. Their customers claimed that the food lack aroma and taste. This is a strong as to why they visit other nearby restaurant which more delicious food. The vendors are frustrated and are planning to have a meeting with their chairperson. One of the vendors is your neighbour and has approached you some piece of advice prior to their official meeting.

Task

As a chemistry student provide guidance to your neighbor on;

(i) The category of ingredients it can be vendors 02scores

Flavouring agents examples honey, onions, Royco

ATLEAST 1C+IE=02scores

(ii)advise the food vendors on any danger associated with use of products of the clients **(04cores)**

Allergic reactions like diahorea, skin irritation/rashes, vomiting to some individuals. This is mitigated by limiting their consumption/stopping

Can lead to digestive disorders like ulcers, stomachache. This is mitigated by stopping the use of additives

Some additives contain heavy metals e.g. cooking oil, carry powders which can lead to neutral additives. This is mitigated by opting to natural additives

Eye irritation during peeling of the onions. This mitigated by pulling on safety glasses

2Se +2Sm=04scores

(iii) Help her to make an evaluation on the products **(03scores)**

Similarities

Both improve aroma and taste of food

Both contain chemicals which have side effects to man

IS+1D=02SCORES

IS +2D=3SCORES

Difference

Natural	***Artificial***
Less effective in action	***more effective action***
Have less side effects	***More side effects if used***
Extracted from plants and animals	***Synthesized from chemicals/undergoes through chemical reaction***

Item 2.

Mary wishes to start up a textile industry in order to produce materials to be supplied to the neighboring schools for making school sweaters for students however, Mary lacks knowledge on the choice of the best materials that can be used with minimal environmental effect.

task

As a learner of chemistry,

(a) Explain,

(i) the categories of the materials ***(03scores)***

Natural polymers/materials are those that exist in nature e.g cotton, silk and wool.

Artificial polymers/material are those that are made /synthesized e.g nylon

-DENY/1SCORE FOR ONLY CATERGORY

2C+2R+2EX=03scores

(ii) the suitability of material selected ***(04sccores)***

4 p+1 u=04scores

Cotton	***Wool***	***NYLON***
It is soft and thus easily compressed ***Strong and durable hence can last for long*** ***It is biodegradable hence can easily decomposed.*** ***It is readily available making it cheap to obtain*** ***It is light thus ideal for sweater***	***Absorbs moisture and releases it quickly*** ***It is insulator hence keeps warmth*** ***It is strong and durable*** ***Biodegradable hence soil depression***	***Elastic thus flexible*** ***Light weight*** ***Chemical resistant thus does not react with chemical*** ***It is durable thus last for long*** ***It is strong***

(iii) the impact of the material on the environment ***(02scores)***

Cotton produces bud smell (air pollution) when decomposing /when burnt. This is mitigated by the opting to use other alternatives

Sheep farming produces methane gas which is a greenhouse gas thus causing global warming. this is mitigated by proper pasture management

Nylon is non-biodegradables/produces pollution when burnt. this is mitigated by recycling.

NOTE: Reject only danger without mitigation.

Di+Dm =02scores

SECTION B

*Choose **one** item from **each** part*

Part I

Item 3

Ladies in kiryatete women's group Hoima city have given up on using soap in their homesteads due to its price fluctuation and the chairperson of the group has a suggestion of processing a liquid soap as an alternative since it is cheaper, however, she has some doubts on its process of production and impact to their ecosystem

Task

She has approached as a chemistry student to settle her doubts. Write a message to guide her in her presentation in the fourth group meeting **(11scores)**

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RAW MATERIALS

Oil/fats,

Purified water,

Suffocant,

Fragrances and dyes,

PRODUCTION PROCESS

Vegetable/oils/fats are mixed with suffocants in vessel and heated between (38-49) ^{o}C to facilitate the blending of ingredients. The mixture is blended for some time to allow uniform distribution of ingredients. Purified water is added to the mixture. purified water is added to the mixture while stirring and mixture is cooled. The mixture is filtered to remove impurities/sediments and fragrance and dyes are added as needed. The liquid is filled in the bottles and other containers for storage.

SIDE EFECTS /DANGERS AND MITIGATION

Hot surface burns from the container leading to injuries to workers. This is mitigated by proper use of PPE's e,g gloves, overall coat, face shield, gumboots etc

Fumes from mixing of ingredients which leads to respiratory problems/can cause eye problem. This is mitigated by use of PPE

Noise pollution from machines leading to the hearing problem to workers. This is mitigated by use of barrier/ doing manufacture in sound proof building to prevent around people of industrial areas.

SOCIAL BENEFITS

Source of employment opportunities =salary=improved standard of living

Markets for agricultural goods provided by the workers in the industries hence =improves the standard of living.

Item 4.

Rushekye hills in Kisoro district are found to contain significant iron deposit. A foreign investor wants to set up an iron and steel rolling factory to tap into the opportunity. The parliament is debating about the project; however, they seem not to understand how iron can be obtained from its raw material, the possible side effects and consequently its benefits. The members are confident that you can provide the necessary information.

Task.

As a chemistry student, write a presentation you can make to these members (***11scores***)

RAW MATERIAL

Iron ore, haemitite, magnate, sidelite, coke, limestone

EXTRACTION PROCESS/PRODUCTION PROCESS.

Iron ore, haemitite, magntite, sidelite, coke, limestone are fed into blast furnace from the top.

Hot air is then blown from the bottom of funnel through pipe called tuyeres. Coke is oxidized by hot air to form carbon dioxide gas. Carbon dioxide gas is reduced by unburnt coke to carbon monoxide gas. Carbon monoxide then move up the furnaceS and reduces ore to impure iron/pig/cast iron. Limestone decomposes to form calcium oxide and carbon dioxide gas in presence of heat.

Calcium oxide is then reacted with silicon (vi)oxide to form calcium silicate which is then tap off. The impure pig/cast is purified to wrought iron.

SIDE EFFECTS OF IRON EXTRACTION

Hot surface burns from heated furnace leading to injuries to workers. This is mitigated by use of PPE

High level of carbon dioxide in the atmosphere leading to global warming and climate change. This is mitigated by collecting carbon dioixde gas and putting into use/ planting trees.

Carbon monoxide gas leading to suffocation of workers. This is mitigated by installing catalytic converters.

SOCIAL BENEFITS

Employment opportunities=salary=improved standard of living

Making of alloys used in making electric sockets

Source of government revenue when exported to another countries through taxes hence improve infrastructure such hospital.

Part II

Item 5

During a school holiday, Eva visited her aunt who works at stone quarry. She noticed explosives were being used to blast big rocks to form small stones. Besides the social benefits Eva was concerned about what would happen and community if the activity continued over time.

Task

As a learner of chemistry, make a write up to respond to Eva concerns. (11**scores)**

- ***Vegetation/rock***
- ***Vegetation is renewable resource, because it can be replaced /replenished once used up***
- ***Rock is nonrenewable resource, because it cannot be replaced after use***
- ***Vegetation is composed of carbon, hydrogen, oxygen and mineral ions***
- ***Rock is composed of gold, aluminum, diamond, quartz, limestones, marlstone, feldspars etc***
- ***Stone quarry involves the breaking of stones into small stones and gravel for construction purposes. This can disrupt the underground water cycle and sources hence reduced water quality. air and destruction of vegetation.***

Impact of human activities on natural/environment

- ***Dust from stone quarry affects air quality leading to respiratory problems such asthma, cough and flue. This is mitigated by use of explosives that produce less dust/by putting on protective gears such face shield***
- ***Accident to workers by holes left/created after quarrying. this is mitigated by filling the holes after quarry***
- ***Destruction of water cycle, soil structure and life around quarrying site. This is mitigated by carrying extraction of rocks carefully and evicting locals from such areas together with their properties.***

USES OF ROCKS/VEGETATION

- ✓ ***Used in construction of roads, buidings, bridges example gravel, stones, marbles***
- ✓ ***Natural resource like gold is used in making jellewery like ear rings, watches etc***
- ✓ ***Weathering of rocks leads to formation of fertile soils that support plant growth.***
- ✓ ***Rock sites are used for tourism generating government revenue***
- ✓ ***Rock provides water for domestic uses***

Item 6.

Peter the cattle keeper grazes his cattle on the community land. During the dry season he practices bush burning and also take his cattle to drink water from the community water source. peter practices are raised concerned in the community. The area chairperson has organized a meeting to create awareness for peter and the community.

Task

As learner of chemistry, make a write up of the message the chairperson will present to the community ***(11scores)***

- ✓ ***Burning of bushes and over grazing, watering cattle affects vegetation, air , soil and water which are renewable resource because they can be replenished/ replaced.***
- ✓ ***Water is a renewable natural resource it can be replaced naturally through process like rain formation***
- ✓ ***Water is composed of hydrogen atoms, oxygen atoms and dissolved mineral ions***
- ✓ ***Vegetation is renewable resource, because it can be replaced /replenished once used up. Vegetation is composed of carbon, hydrogen, oxygen and mineral ions.***

Impact of human activities on natural/environment

- ❖ ***Burning of bushes results into global warming hence climate change and famine to people. This is mitigated by use of bush fallowing and paddocking.***
- ❖ ***Burning of bushes leaves the soil bare which exposes to agents of erosion leading to soil erosion. This is mitigated by planting of trees, mulching, terracing and by setting laws prohibiting individuals from burning of bushes.***

  Overgrazing destroys soil structure increasing the risk of soil erosion and mudslide. This is mitigated by paddocking.

- ✓ ***Animal may defecate and urinate in water bodies polluting it for human consumption by changing the turbidity and providing condition that favour growth of micro-organisms.***

PREPARED BY ODOPING CEASER CHEMISTS

THE END

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